



NETA 15-09 2004

"...A SENTENCE FROM YOU ..."

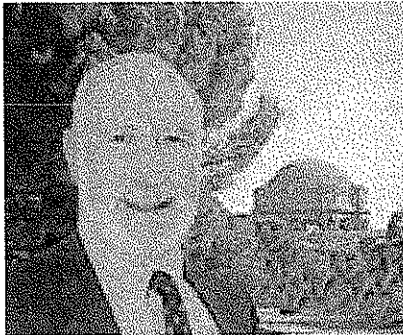
- Mateix Dia -

NORM ABRAMSON – ALOHA-net Inventor.

Interviewed on September 15, 2004 in Honolulu, Hawaii.

Born in [DATE] in [PLACE]

BOSTON MA 1932, April 1



He is a founder and first CEO of ALOHA Networks in San Francisco. From 1968 to 1996 he was a Professor of Electrical Engineering and a Professor of Information and Computer Sciences at the University of Hawaii. He has also been a member of the faculty at Stanford, Berkeley, Harvard and MIT. At the University of

Hawaii he served as Chair of the Information and Computer Sciences department and as Director of the ALOHA System research project. He directed the effort at the University of Hawaii which led to the construction and operation of the ALOHANET. He has served as Consulting Expert in Communication Systems, Data Networks and Satellite Networks for the ITU (Geneva), UNESCO (Paris) and the UNDP (Jakarta). He is the recipient of several international awards including the 1995 IEEE Koji Kobayashi Computers and Communications Award and the 2000 Technology Award from the Eduard Rhein Foundation.

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1953 / Physics -> Undergrad. Harvard -
 1955 / Masters UCLA
 1958 Ph D - EE -> AT STANFORD

- Faculty Stanford

1964 I left Stanford,

64-65 - Visiting Harvard

1965-66 Hawaii - Tokyo, rented a mullboat.

1994 I left and came back to SFO to start ALOHA Net.
 (In SFO presidency).

Do you remember when you had your first contact with a computer?

Jan 1953 -> Harvard Studying Physics - First computer HOWARD AIKEN MARK II computer.

Put time working in Systems Lab. HUSE Aircraft Company (CA) summer of 53.

What was your first contact/experience with Internet or ARPANET?

First exp with ARPA. I went over to talk with Bob Taylor and Larry Roberts was there. I was looking for some support. They had ideas although not via radio. (maybe 1968). I year after I arrived to Hawaii. We proposed for a it was an interesting thing to build. Larry Roberts really liked the ALOHA net (when Bob quit to Xerox).

In your opinion, what are the key characteristics of Internet?

We were the first network.

Telephone dialup oriented.

9600 bps -> we started. Always on no dialup. Connection free. If you want to send small amounts of data you have overhead.

OK
99% of the ethernet user connection is overhead.
1 or two bytes translated for HTTP.
500 bytes for that click.

In sat radio 90% of the cost is in upstream link terribly inefficient.

Chaos

- OK
- ① Anarchy aspects of the net. Very overregulated telecom that we've seen in the 80's Not to have to deal with telecom bureaucrats.
 - ② Inefficiency of resource 99.9% bits of protocol for 1 of info. I can't tell you any other tech. It's not for a bad design. It was there just 30 years ago for symmetrical telecom.



What do you consider the most important milestones in the development of the network?

1970-1975 establishment of a true routing network
1975-80 - " of Internet protocols which permitted to establish net.

Project started
End 1968

How did you contribute to the development of the Internet? ARPANET

- selected the project which first did digital radio-communic.
- RandomALOHA radio channel. We design and built the equipment. And implementation of that.

ALOHA Net
Runs

DICK BINDEA

Working 3 years with

NSF, IBM, ARPA.

1970 First microprocessor came out from Intel.

NED WALDON

Bob Kahn.

TOM GARDNER

Who are some key people in the development of Internet, leaders or trendsetters? Without money to build more stuff. I spent time in projects the Univ never used the network. I used it, to the central computer.

- To [NAME] for his/her contributions to...
- To We connected to most of the major OAHU, BIG ISLAND, radio repeaters to cover more than 400 km.
- MADI - Univ campus in Big Island.

- Larry Roberts, Key driving force. And the ALOHA net too. He was the first he came up SLOTTED ALOHA channel.

Two anecdotal situations

He convinced his boss, to send him to Hawaii (to work together) as a postdoc. He did something diff. Taking the ALOHA. ch. I for a diff. ALOHA - is two channels (go, and back).

In a cable is one half bad.

But not better CSMA/CD.

What do you think about the future of Internet?

Has a future, is a society changing technology.

Will increase so much in the pervasiveness of the network in many places (not how much later).

BBN group Frank Heart.

We had random time...
retransmission...
to very beginning.

Do you see any technological trends?

Wi-Fi - brings Ethernet to ALOHA. But is a single channel system and had a lot of problems due to take the ethernet cable ideas comeback to radio. The traffic to the user efficient from the user is random access and inefficient. If you add this everywhere is inefficient. But is not so reliable as cable is. Was probably as a poor design.

ADDITIONAL READING

PAPERS & BOOKS MENTIONED / RECOMMENDED

The 11Mbps is way way down below that. Because of the fact is a single channel system.

Larry Roberts / Bob Metcalfe - Xerox.
Paul Baran.

FRASE
Gert de Mariani.
Excuse for photos Keller.

There were

1971 - 64Kbps - SAT channel who connected us to ARPAnet - AlohaNet.

1971 ATS-1 (Naval Sat) connected to Alaska, Japan & Sidney Australia.
Advance Tech Sat.

ANECDOTES

- The way in which we got the SAT IMP in Hawaii early 1970 ARPAnet started to grow and he had the list on his blackboard in his office. Hawaiian not that list. We went off from this office and inserted Hawaii and a date 5 months later.

Larry went back and I left without telling that
in Aug 26 → I had to call from Frank Heart to install it.
So there you see the perfect planning of the Pentagon

- MERISAT was the first commercial use of an ALPHAS channel they call something else. They were concerned in patent issues.

IRVING GOLDSTEIN chief counsel of COMSAT (US representative of Intelsat) he introduced the company and all the engineers and he was with me during 2 hours. He became the CTO and president of the company. They were concerned that we were looking for money I never was with a big lawyer of the company when I just want to talk with a few companies.

People

- Paul Brian, but has original ideas of packets and routing. It was pretty natural after inventing the kind of data to (burst & random data). Make sure about the list

Ned Waldon

Tom Gardner.

ALAN OK ~~NAK~~ NAK N

FRASE